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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/601,946	09/21/2000	Mathias Benz	6110-186STA1	5265

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EXAMINER
STRICKLAND, JONAS N

ART UNIT	PAPER NUMBER
1754	12

DATE MAILED: 03/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/601,946	BENZ ET AL.	
	Examiner	Art Unit	
	Jonas N Strickland	1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 March 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *11* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/4/03 has been entered.

Response to Amendment

2. This Office Action is in response to the RCE, the preliminary amendment and the Information Disclosure Statement filed on 3/4/03. Claims 1-9 are pending. Claim 3 has been amended in order to overcome the 35 U.S.C. 112 2nd paragraph rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yazami et al. (FR 2704216 A1) in view of Von Sacken (US Patent 5,180,574) and Sheargold et al. (US Patent 5,702,679).

Applicant claims a process for preparing lithium transition metallates of the general formula:

$$Li_x(M^1_yM^2_{1-y})_nO_{nz}$$

The metallate is prepared by calcining an intimate mixture of oxygen-containing transition metal compounds and an oxygen-containing lithium compound, which has been obtained by treating a solid powdered transition metal compound, with a solution of the lithium compound and drying, characterized in that at least the M^1 compound is used in the form of a powder with a specific surface area of at least 10 m^2/g (BET) and calcinations is performed in a moving bed.

Yazami et al. discloses electrode materials for rechargeable lithium batteries and their process of synthesis. The compound utilized by Yazami et al. corresponds to the formula $Li_{ny}(M_{1-x}M'_x)_nO_{nz}$ in which n is 1 or 2, characterized by the fact that M and M' are identical or different and are chosen from the transition metals, by the fact that $0 < x \leq 1$, $0 < y \leq 1$, $1.8 \leq z \leq 2.2$, and by the fact that the compound has a specific surface area is between 1.5 and 50 m^2/g. The compound in which M and/or M' is chosen from Ti, V, Mn, Cr, Fe, Co, Ni, Zr, Nb, Ta, W, Mo and Re is particularly preferred. Calcining is done in an oxidizing atmosphere. The preparation of the mixture of precursors is done in a liquid medium, then dried, and then calcined. However, Yazami does not disclose calcinations being carried out in a moving bed.

Von Sacken teaches producing lithium mixed metal oxides using rotary calciners and fluid beds, which are moving beds (col. 9, lines 22-26 and col. 13, lines 10-18).

Sheargold et al. teaches a method for producing lithium metal oxides, and wherein rotary kiln's are preferable over stationary beds, because rotary kiln's shorten

reaction times and avoid the production of unwanted byproducts (col. 3, lines 58-67 and col. 5, lines 50-54).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the teachings of Yazami et al. to calcine lithium mixed metal oxides in a moving bed, because Von Sacken et al. teaches a process for calcining lithium metal mixed oxides in a moving bed, such as rotary calciners and fluid beds and Sheargold et al. teaches wherein rotary kilns are useful in shortening the reaction time when producing lithium metal oxides. Such modification would have been obvious to one of ordinary skill in the art, because one of ordinary skill in the art would have expected a process for producing lithium metal oxides, which are calcined in moving beds as taught by Von Sacken et al. and Sheargold et al., to be similarly useful and applicable to a process for producing lithium metal mixed oxides, which are calcined by conventional methods, as well as different calcining conditions as disclosed by Yazami et al.

Furthermore, with respect to claims 3 and 4, it would have been obvious to one of ordinary skill in the art to expect the mixed transition metal compound to contain at least some of the M^2 compound in a solution of the lithium compound for impregnating the M^1 compound, because Yazami et al. teaches wherein the transition metal compounds are in a mixed liquid solution. It would have been obvious for some of the M^2 compound in a solution of the lithium compound for impregnating the M^1 compound, since Yazami et al. teaches a mixture of transition metals in a lithium solution.

5. Claims 2 and 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yazami et al. (FR 2704216 A1) in view of Von Sacken (US Patent 5,180,574) and

Sheargold et al. (US Patent 5,702,679) as applied to claims 1 and 3-5 above, and further in view of Mao (US Patent 5,728,367).

Applicant claims with respect to claim 2, wherein the transition metallate is milled and sieved after calcinations and the finer fraction from sieving is recycled to the moving bed. The teachings of Yazami et al., Sheargold et al., and Von Sacken have been discussed with respect to claims 1 and 3-5, but these references do not teach the limitations of claim 2, as well as claims 6-9.

However, Mao teaches a method for preparing lithiated transition metal oxides and wherein the materials after heating (calcining) are subjected to a grinding process in a conventional mill (col. 4, lines 61-64). Mao continues to teach that after the milling process that the lithium transition metal oxide by-products may be re-used and reprocessed (col. 5, lines 4-14).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the teachings of Yazami et al., Sheargold et al., and Von Sacken by milling the transition metallate after calcining and recycling the milled transition metallate back to the reaction bed, because Mao teaches after calcining a lithium transition metal oxide, the lithium transition metal oxide is milled and recycled back to the reactor. Such modification would have been obvious to one of ordinary skill in the art, because one would expect a process for fabricating lithium transition metal oxides as taught by Mao to be similarly useful and applicable to a process for producing lithium transition metal oxides as taught by Yazami et al., Sheargold et al. and Von Sacken.

With respect to claim 6, Yazami et al. teaches calcining in an oxygen-containing atmosphere. With respect to claim 9, Yazami et al. teaches wherein the transition metal compound spray dried.

With respect to claims 7 and 8, Mao teaches $LiNO_3$ (col. 6, line 10) and NiOH (col. 4, line 12). Mao also teaches wherein NO_2 is released during calcinations and recovered as nitric acid and reacted with LiOH to give $LiNO_3$ (col. 5, line 25 – col. 6, line 15).

Response to Arguments

6. Applicant's arguments filed 3/4/03 have been fully considered but they are not persuasive.

Applicant argues that Yazami discloses the specific surface area of the product being between 1.5 and 50 m^2/g and that Yazami is completely silent about the specific surface area of the starting compounds. Applicant continues to argue that at least the M^1 compound (a starting compound), be used in the form of a powder with a specific surface area of at least 10 m^2/g (BET).

However, Yazami discloses calcining the dried mixture of precursors to obtain a surface area between 1.5 and 50 m^2/g (p. 4, lines 12-17). The surface area disclosed by Yazami is referring to the precursors. On page 3, lines 5-8 Yazami discloses the specific surface area of the starting precursors, after listing the starting precursors that may be used in the lithium mixed metal oxide. Yazami clearly teaches wherein the starting precursors after calcining have a specific surface area between 1.5 and 50 m^2/g, which meets the instantly claimed specific surface area of at least 10 m^2/g.

Furthermore, with respect to Applicant's argument concerning the specific surface area it would have been obvious to one of ordinary skill in the art to expect the lithium transition metallate disclosed by Yazami to exhibit the desired specific surface area, since Yazami discloses the same general formula as instantly claimed for the lithium transition metallate.

With respect to Applicant's that Von Sacken teaches a different substance from the substance that is instantly claimed and that Von Sacken is mechanically mixed, Von Sacken has been applied to teach that one of ordinary skill in the art would have found it obvious to perform a calcining in a moving bed, since Von Sacken clearly teaches wherein a rotary calciner may also be utilized in producing a lithium transition metallate (lithium nickel dioxide; col. 9, lines 23-26). Sheargold et al. nor Von Sacken have been applied to teach the instantly claimed general formula for the lithium transition metallate, because Yazami has already disclosed the general formula for the instantly claimed lithium transition metallate. Sheargold et al. and Von Sacken have been applied to show the advantages of carry out calcining in a moving bed in processes for producing lithium transition metallates.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonas N Strickland whose telephone number is 703-306-5692. The examiner can normally be reached on M-TH. 7:30-5:00, off 1st Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 703-308-3837. The fax phone

numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-0661.

Jonas N. Strickland
March 18, 2003

Wayne A. Langel
WAYNE A. LANGEL
PRIMARY EXAMINER